- 1. A cored electrode for arc welding, said electrode having a core in which the fill material includes a manganese-containing composite particle.
- 2. The electrode of claim 1 wherein the composite particle contains manganese in admixture with a shielding material.
- 3. The electrode of claim 2 wherein the shielding material is TiO_2 .

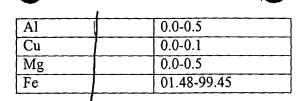
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- 4. The eletrode of claim 3 wherein the shielding materials is rutile.
- 5. The electrode of claim 4 wherein the shielding material is anastace.
- 6. The electrode of claim 1 wherein the wire contains at least about 0.5% by weight manganese.
- 7. The electrode of claim 2 wherein the composite particle contains manganese encapsulated in a coating of said shielding material.
- 8. The electrode of claim 2 wherein the composite particle is made up of manganese particles dispersed in a matrix of the shielding material.
- 9. The electrode of claim 1 wherein the composite particle itself contains about 15 to 40% manganese based on total particle weight.
- 10. The electrode of claim 1 wherein the electrode is formulated for welding on mild steel and has the following composition in approximate percent by weight:

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Constituent	Mild Steel
C	0.0-0.12
Mn	0.5-3.0
Si	0.0-2.0
Ti	0.05-0.7
В	0.0-0.1
Cr	0.0-0.4
Ni	0.0-0.5
Mo	0.0-0.1
V	0.0-0.5

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11. The electrode of claim 1 wherein the electrode is formulated for welding on low alloy steel and has the composition in approximate percent by weight.

Constituent	Low Alloy
C	0.0-0.13
Mn	0.5-3.75
Si	0.0-2.0
Ti	0.05-0.7
В	0.0-0.1
Cr	0.0-10.5
Ni	0.0-3.75
Mo	0.0-1.2
V	0.0-0.25
Al	0.0-0.5
Cu	0.0-0.75
Mg	0.0-0.5
Fe	75 87-99 45

- 12. A method for arc welding which comprises providing a cored electrode having a core of fill material including a composite particle containing manganese, and applying a voltage to said electrode upon contacting a work piece to cause said electrode to melt and form a weld metal bead.
- 13. The electrode of claim 12 wherein the composite particle contains manganese in admixture with a shielding material.
- 14. The method of claim 13 where a shielding gas is supplied to the point at which the electrode contacts the work piece and the shielding gas consists of argon
- 15. The method of claim 13 wherein the electrode contains magnesium and a shielding gas is supplied to the point of contact between the electrode and the workpiece and the shielding gas is a mixture of argon and carbon dioxide.



- 16. The method of claim 11 wherein the method is further characterized in that the fume produced upon applying the voltage contains reduced amounts of manganese.
- 17. The method of claim 16 wherein the fume contains less than 7% ppm manganese.
- 18. A method for reducing the amount of manganese in a fume generated during arc welding which comprises incorporating manganese in the core of a welding electrode as a composite particle of manganese and a shielding material.
- 19. A composite particle comprising manganese particles in a matrix of titanium dioxide particles.

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